Randall Rohe
Department of Geography
University of Wisconsin-Waukesha
1500 University Drive
Waukesha, WI 53188

GEOGRAPHERS AND THE LAKE STATES LUMBER ERA: A PROSPECTUS

Geographers showed an early interest in the Lake States lumber era. Among the earliest works to examine this period were studies by Dopp, Cheyney, Cook, Licking and Watson. These early efforts, unfortunately, were not sustained. With a few exceptions, contemporary geographers have neglected the Lake States lumber era. Historians, anthropologists, archaeologists, and others have contributed much to our knowledge of this era. Their work, of course, generally lacks a geographical perspective. Without such a perspective, lumbering’s role in history remains vague and its enduring significance to the present uncertain. The possibilities for geographical studies of the Lakes States lumber era are almost endless. The studies naturally fall into four categories: 1) population and migration 2) settlement elements and patterns 3) man-land relationships 4) origin and diffusion of logging and lumbering methods. Potential topics for research are suggested.

Introduction

In the United States, the generalized historical pattern of lumbering resembled a continuously expanding wave that spread westward across the nation. Exploitation began slowly along the Eastern Seaboard with greatest concentration along the New England coast in the 17th Century. It took more than a century and a half for the crest of this wave to reach New York and Pennsylvania. Thereafter, it gained momentum to achieve highest production in the Lake States in the 1880s (Cox, 1983, pp. 387-388).

The era of large-scale lumbering in the Lake States was brief. Between 1869 and 1879, the region’s lumber output jumped 75 percent from a reported 3.6 billion to 6.3 billion board feet; by 1889, it had again increased about 60 percent to nearly 10 billion board feet. By 1899, however, production had declined to 8.7 billion board feet, and in 1909 to 5.5 billion. It reached a low of 289 million board feet in 1932; the period of intense activity had lasted less than five decades. In its half-century of dominance, however, the industry left an indelible mark on the geography of the region (Twinning, 1983, p. 373).

Kasbarian, 1987; Kromm, 1968; Belthuis, 1965). Historians, anthropologists, archaeologists, and others have contributed much to our knowledge of this era. Their work, of course, generally lacks a geographical perspective. Without such a perspective, lumbering’s role in the region’s history remains vague and its enduring significance to the present unclear. The possibilities for geographical studies of the Great Lakes lumber era are almost endless. These studies naturally fall into four categories: 1) population and migration 2) settlement elements and patterns 3) man-land relationships 4) origin and diffusion of logging and lumbering methods.

Population and Migration

The labor force for the Great Lakes’ logging industry was supplied largely by immigrants from the Eastern states and foreign countries. The transitory nature of the lumber industry resulted in frequent migrations. As the timber was exhausted in one area, companies moved on and often took their workers with them. Men from Maine, for example, were frequently found in successive lumber regions—in New York, in Pennsylvania, and in the Great Lakes states of Michigan, Wisconsin, and Minnesota. A few went to the South. Some even reached California, Oregon, and Washington during
the third and final major migration of the lumber industry. It is particularly noteworthy how heavily the Great Lakes region drew upon the older lumber areas of New England, New York, and Pennsylvania not only as a source of labor but as a hearth of lumbering methods and techniques. Men from Maine played a pivotal role in the development of lumbering in the Lake States. While numerous works note this contribution, none have adequately examined it. Who went exactly, and what their motivations were, remains unknown and their specific contributions to the development of lumbering uncertain (Smith, 1974, pp. 97-101). A geographical study could shed light on how they effected town layout, style of camps, lumber town architecture, place names, techniques of dam and boom construction, and the diffusion of logging methods.

Not every logger, of course, came from Maine. Period descriptions, in fact, picture the logging camps of the Great Lakes region as "a modern Babel" and "cosmopolitan retreats," with "men from all over the world" and "of every nationality" (Rohe, 1987a, p. 9). Almost invariably, however, native born workers of typical American stock predominated (Engberg, 1949, p. 26 also 1948, 1959). While native born workers represented the majority of all loggers through most of the lumber era, there were always foreign immigrants present. At various times and places, they formed a very noticeable, if not, dominant element in logging operations. The Canadians were the most important because they came in greatest number and came to the US expressly to work in lumbering. Hundreds of them came each fall, worked in the woods all winter and then returned home each spring (Engberg, 1949, p. 43-52). How many Canadians actually came and by what routes? When did their migrations peak? Where did they concentrate in the region and why? In what

Figure 2: Women cooks in the Hanson Brothers' logging camp 1912 probably located in Waupaca County, WI. By this date women were fairly common in the logging camps of the Lake States, especially jobber camps. (Courtesy Malcolm Rosholt)
branches of lumbering did they find their greatest employment? How did they effect the development of logging technology? These are just a few of the unanswered questions about the involvement of Canadians in the Lake States lumber industry.

After the virgin pine and hardwoods were cut, "choppers" or "piecemakers" harvested the scattered smaller timber for ties, posts, poles, and cordwood. Sometimes, lumber companies built small communities to house the laborers employed in such activities. Coalwood, which the Cleveland-Cliffs Iron Co. established near Stillman, MI in 1901 to cut cordwood, is a good example (Figure 1). The settlement consisted almost entirely of Finnish woodcutters and their families (Rohe, 1987a, p. 16). A study of this settlement and how it differed and resembled settlements populated by other ethnic groups would make a fascinating study.

While Finns were active as choppers early on, Kentuckians dominated the cutovers in the 1920s and 1930s. "Kentucky towns" once dotted parts of northern Michigan, Wisconsin, and Minnesota. The "colorful Kentucks," as one local history referred to them, gained a reputation for fighting, moonshining, feuding and violating. Despite their place in the region's folklore, they have not been accorded a scholarly analysis. What push-pull factors prompted the migration of Kentuckians into the Lake States? By what routes and means did they reach the region? Where specifically did they concentrate in the region and why? What elements of their Appalachian folk culture did they successfully transplant to the cutover? What factors promoted retention of some elements of their folk culture and not others? How was the migration of Kentuckians into the Great Lakes region related to their contemporaneous movements to the Cowlitz.

Figure 3: Philletus Sawyer, 1816-1900, typical of the Lake States' timber barons, began his career in lumbering as a lumberjack and sawmill hand in New York. He eventually moved to Oshkosh, WI in 1849 where he amassed a fortune from lumbering and timberland speculation. (Author's Collection)
Valley of Washington, the hill country of central Texas, and the Ozark Highlands of Missouri and Arkansas? Was migration largely by clan or extended family groups, and was there any movement between these areas and the Great Lakes region? During the years after 1900 so many lumber workers migrated to the West that some companies were forced to hire Italians and envision a fascinating and illuminating monograph on Polish or Norwegian logging crews.

Exactly how many Lake States lumbermen migrated to the West may never be known. Perhaps as much as half the labor force in the western lumber industry in the early 1920s had worked previously in the Lake States lumber region. While several works

![Figure 4: The residences of Philetus Sawyer and his son, E.P. along Algoma Street, Oshkosh, WI circa 1890. For many years this street represented the best residential line of the city. (Author's Collection)](image)

other foreigners from the larger cities. Later, woods labor was often recruited from agencies in the larger towns of the region. Many were recent immigrants from Norway, Sweden, and Poland. It was not uncommon to find entire logging crews composed of Norwegians, Swedes, or Poles during the early 1900s (Rohe, 1987a, p. 17). One can examine the movement of major lumberman from the Lake States to other lumbering regions, they are based on scanty data and overlook the loggers and mill hands (Decker, 1959).

The works of Engberg and others provide a composite picture of the Great Lakes lumberjack and Kohlmeyer's (1956)
interesting study of the origin, nationality, educational background, etc. of a number of prominent lumbermen gives us a representative likeness of men like Weyerhaeuser, Hines, Sawyer, and Hackley. We lack, however, a composite portrait of the mill worker and his life and work.

Lumbering was an activity that placed a premium on strength, stamina, and coordination. As a result the industry did not attract large numbers of females. Some writers, in fact, have even stated that no or very few women worked in the logging camps, sawmills, shingle mills, and lumber manufacturers in the Lake States. Previous research on logging camps, however, disclosed numerous camp views that included women (Rohe, 1985d, 1986a, 1987a, pp. 6-9) (Figure 2). This naturally raised the question of not only how common they were in the camps, but in lumbering in general. Has history slighted the role of women in the region's lumber industry? How many females did lumbering employ? Who were they? In what branches of logging and lumbering did they find employment? How extensive temporally and geographically were female laborers in lumbering? Did their role or number change notably with time and, if so, why?

Settlement Elements and Patterns

Throughout the lumber era, lumbermen established many settlements, ranging in size from the most ephemeral of logging camps to large cities. Whenever the lumbermen carried on their logging operations, they set up temporary settlements for the accomplishment of that task. During the height of the lumber era, thousands of logging camps dotted the Great Lakes forest. The lack of prior settlement and the great distances from existing settlement required the construction of these isolated, task-specific sites, which served a residential and industrial function and ranged from one or two buildings to small towns. Most lasted for only a year or two and then were abandoned and disappeared.

While almost all general studies of the lumber era give some attention to the logging camp, historians have not conducted exhaustive studies on these settlement forms. Logging camps experienced enormous changes in size, layout, ethnicity, architectural style and other characteristics between the 1840s and 1940s (Rohe, 1985d, 1986a). While geographers have looked at several of these changes, much remains to be examined. For instance, while they tentatively have identified several different styles of logging camps and determined their probable period of use, the topic needs more study before any definite conclusions can be drawn. The logging camps contained a conglomeration of people who brought with them their own traditions and customs. What influence this had on the camps remains largely unknown. While several archaeologists have attempted to examine the patterning of camps using geographic models, geographers have not (Dinsmore, 1985; Weir, 1985).

The many logging camps scattered up and down the various streams of the Lake States needed an unusually large supply of food and clothing for the men and hay and oats for the animals. In connection with this need came the development of supply centers. On some streams depot camps served to deliver and distribute supplies to the various logging camps. On other streams, however, towns rather than camps acted as supply centers. What factors determined which points became the major supply centers and what changes occurred with time? How did the extension of logging northward, new and better forms of transportation, changes in the methods of logging, the extension and improvement of supply routes and so forth influence the pattern of supply centers? How
important was the function of supplying the lumbering regions to the development of towns? And, to what degree are the supply towns and their supply routes reflected in the present settlement pattern?

Despite the availability of a great deal of primary source material, few adequate historical studies of individual lumber towns are to be found. The major exception is Krog's dissertation and several articles on

Lumbering itself was often too prosaic and commonplace to generate much contemporary interest. The sawmill town, however, often appeared in the popular press. Names like Seney, Hurley, and Saginaw provided the basis for the public's perception of lumber towns. As a result a stereotyped image of the lumber town developed--an image of sawdust streets, lack of planning, rough lumber structures, few amenities, and filled with dens of sin and inequity.

Marinette (Krog, 1971, 1977, 1980). Also, of use is Kilar's (1990) comparative analysis of three Michigan lumber towns and Lewis's (1948, 1949, 1950) examination of a small lumber town past its peak (See also Hanna 1955; Donia, 1964; Cooper and Stilgenbauer 1934; Dunn, 1968). Histories of towns like Oshkosh, Bay City, Saginaw, Marinette, Stillwater etc. beg for a geographic treatment. In many instances, the basis for such a study already exists. Both historians and geographers, for instance, have examined aspects of Oshkosh's

Figure 5: Mill laborers' houses in the embryonic lumber company town of Goodman, WI circa 1910. The standard uniform architecture of houses is a distinguishing character of such towns. (Author's Collection)
lumbering history (Rohe, 1988a; Phelan 1954; Bradbury, 1926). Just as needed is a general geographical synthesis of Great Lakes lumber towns as part of an urban frontier.

In large degree, lumbering was an urban frontier. As the focus of early economic activity, the sawmill was the nucleus of a great many settlements. The comparative analysis of the lumbering frontier as an urban frontier is yet to be done. Such an analysis, however, is essential to a full understanding of the significance of the lumber era to the present, and could offer insight into American urban history for the Great Lakes lumber era was part of that history and differed in degree not kind. It, for instance, might shed light on the role that these communities played as cultural and social transmitters and amalgamators of foreign and American customs.

Many elements of the lumber towns deserve individual study. In these towns, the profits of logging and lumbering created and sustained a group of “frontier aristocrats”—the timber barons, men like Frederick Weyerhauser, David Ward, and Philetus Sawyer (Figure 3). Historians have examined this group both collectively and individually (Current, 1950, Twining, 1970; Lewis, 1957, 1958; Maybee, 1948; Kohlmeyer, 1956; Gates, 1954). Typically these works are largely biographical accounts stressing their rags to riches story. The physical manifestations of their success, their ostentatious, palatial homes, have generated little study (Figure 4). Where they built their homes, in what styles, whether they were architect-designed, if they displayed any regional and/or temporal variations are just a few of the questions that a geographical study could answer.

The population of these towns, especially, offers a potentially rewarding area of research. Blackburn and Ricard’s (1970) study of Manistee County, MI. provides insight on the population characteristics of a lumber frontier. The Great Lakes lumber era, however, covered several decades and many thousands of square miles. It seems likely that differences of time, place, specific function, levels of prosperity etc. produced significant variations in the population characteristics of the hundreds of lumber towns that existed between 1830 and 1930. More quantitative studies can help us better appreciate this complexity. A computer analysis of the original manuscript censuses, city directories, etc. that examines ethnicity, population fluctuation, instability/turnover, occupational structure, sex-age structure, and living patterns would give us a much clearer picture of the nature of the Great Lakes lumber town. Mann’s study of two California mining towns offers an excellent model for such a study (Mann, 1982).

Lumbering’s clearest impact on urbanism came in the company town, a settlement built solely to support a company’s operations and house the laborers who worked in their mill/mills and logging camps. David Wing’s thesis, "A Michigan Lumber Village," written in 1898 affords a unique period view of an unnamed company town in upper Michigan and suggests to the careful reader many possibilities for geographical study. The standard uniform architecture of houses is a distinguishing character of such towns and offers one of many areas for research (Figure 5). What styles dominated and why? Were there temporal and/or regional variations in style? How did the houses built by lumber companies compare to those built to house workers in other economic activities?

Their unity of function made the lumber company towns self-contained and self-sufficient, but in time contributed to their decline and sometimes their extinction. (Figure 6) "They were part of the stock in trade, to be abandoned along with cutover land and nonportable equipment if economy
so dictated—'ghost towns' until they were gradually wrecked for their material or fire removed them from the landscape." (Davis, 1938, p. 668) As yet, we lack an adequate synthesis or analysis, either historical or geographical, of lumbering ghost towns. Of primary consideration would be why some towns died and disappeared, while others with basically similar beginnings survived. Is it possible to identify the physical and/or cultural factors that determined whether a company town survived or passed into history? Moreover, we lack a detailed view of economic conditions and day-to-day life associated with the boom and bust cycle characteristic of such towns and the economic and lifestyle shifts related to unstable economic conditions so characteristic of them.

In parts of the Lakes States, lumbering laid the foundation for the development of a tourist-recreation industry. (Espeseth, 1953) Logging camps became fishing and hunting shacks. Some logging inns and camps became resorts. Logging railroads provided access for hunters and fishermen. Some lumber towns evolved into recreational centers. Later, abandoned logging roads and railroad grades became hiking trails, cross-country ski trails, snowmobile trails and ATV trails. As yet no one has examined this role in detail.

**Man-Land Relationships**

What is particularly surprising considering its massive assault on the environment of the Lake States is the paucity of works by geographers that examine the environmental impact of lumbering. With relatively primitive technology, the lumbermen caused rather radical changes in the Great Lakes forest. Lumbering resulted in significant changes in vegetation and wildlife and notable alterations of natural drainage and terrain conditions (Ahlgren, 1983; Lapham, 1967; Gates, Clarke and Curtis, 1983; Flader,

![Figure 6: Shanagolden, WI like many lumber company towns, disappeared with the end of lumbering. Today only a few remanents, including these remains of its sawmill, survive. (Author's Collection).](image-url)
1983). While man's impact on the land has been an important, if not central, theme of historical and cultural geography from their beginnings as academic disciplines, the extent and nature of these changes have been little examined by geographers.

In forty years the lumbermen had logged nearly the entire northern portion of the region. The pine had disappeared from most of the mixed forests and the greater part of the pinery itself had been cut (Roth, 1898). In addition the fires following most logging operations considerably altered the forest (Vogl, 1964; Kilburn, 1960).

The careless logging methods of the time were an invitation to fire. The loggers removed only the choicest pine, leaving on the forest floor great heaps of branches and tops known as "slashings." One spark could start a fire that would not only destroy the forest but sometimes the soil itself. Moreover, the clear cutting had removed most or all of the seed trees which would have ordinarily persisted in protected places. This meant that the succession following lumbering differed greatly from the original forest.

Using original US Land Survey notes, maps of the presettlement vegetation of the Lake States have been constructed (Finley, 1951; Bourdo, 1983; Wheeler, 1898; Thomson, 1945; Icke, 1941). The Lake States Forest Experiment Station has constructed maps of the forest cover for the 1930s and 1950s. Waddington (1978) examined the historical record of settlement in Minnesota, including logging, and related it to sedimentation (pollen sequence) in eight Minnesota lakes. These provide a good sense of the regional changes in vegetation. In some cases we even have the changes shown on the township level. (Stearns, 1949)

While we have a good sense of the modifications lumbering caused in vegetation at the regional, state, and township level, no study looks at the micro

Figure 7: Group of river drivers on the Clam River circa 1902. Using pike poles and later peaveys (shown in this photo), the loggers drove the logs downstream to the sawmills. The log drive usually began in late April or early May and lasted well into June, sometimes later. (Author's Collection)
scale. What ruderal vegetation occurs at the sites of logging camps, landings and rollways, logging roads, tramways, railroads, etc. It's generally accepted that logging followed by repeated fires resulted in the creation of bracken-grasslands but how common are they, what's their present distribution and has it changed significantly over time? While logging and the fires that followed almost completely altered the vegetation of the Lake States, some remnants of the original forest survived. What is their distribution and why were they preserved?

In addition to vegetation changes, changes in drainage occurred. In many places lumbering and fires destroyed the humus layer. The bare ground allowed a rapid run-off of water and erosion and floods resulted. Decided changes in drainage and soil moisture occurred in some areas. Swamps dried up, lakes diminished in size, streams became unusable for log driving, or for the generation of power to run sawmills; some permanent streams even became intermittent or disappeared altogether (Lapham, 1967). So far, none of these has been examined in any detail at all.

The cutting of the forest resulted in loss of vast areas of habitat for some wildlife species and creation of equally vast regions with ideal habitat for others. Deer, snowshoe hare, prairie chicken, ruffed and sharptail grouse, and various song birds were all affected. While biologists have studied the effects of lumbering on most of these species to some degree, only deer have been looked at in any detail and no study examines their changing distribution geographically (Habbeck and Curtis, 1959).

Throughout the nineteenth century, almost the entire lumber cut of the Lake States consisted of white pine, and the major form of log transportation was river driving--moving logs by floating them down the waterways using natural or flushed stream flow (Figure 7).

In their natural state, many rivers and streams offered serious obstructions to log driving in the form of boulders, rock-strewn rapids, narrow gorges, waterfalls, sandbars, or accumulations of driftwood and fallen trees. As the lumber industry expanded northward, many alterations of the natural waterways took place to assure successful driving. The lumbermen cleared the streams of various obstructions, changed and deepened their channels, and controlled their regimes by dams. Visual comparison of portions of streams improved for driving with those not offer dramatic evidence of its impact (Rohe, 1981).

By artificially controlling their regimes, the logging dams often modified the streams (Figure 8). Waters released by the dams to carry logs downstream would erode the banks. This widened the river bed, undermined trees that fell into the river, and created new sandbars and mud banks. Log driving especially widened the tributary streams as a result of the artificial freshets from logging dams and by the impact of the logs against the stream banks. More dams created more artificial floods, which in turn increased the work necessary to keep the channel in shape for driving.

Removal of natural vegetation during the lumber era undoubtedly increased both surface runoff and soil erosion and consequently altered stream regimes. Logging not only removed the natural cover which had been so effective for intercepting precipitation and protecting the soil from erosion, but the fires that followed considerably reduced soil humus content, which enhances soil infiltration capacities and thereby decreases magnitudes of surface runoff and erosion.

Significant changes in erosion, sediment transport, and channel morphology often occur when an existing balance between land cover and climate is disrupted through
man's activities. The larger and more frequent floods following deforestation and exacerbated by the use of logging dams would have increased the yields of both bedload and suspended sediment load. Most of the eroded material was probably deposited within the stream channel, on colluvial slopes, and on the floodplain. While many logging histories devote some space to river driving and stream improvement, only one looks at its importance in any detail on a specific river system and examines its effect on the natural landscape (Rohe, 1984b). No study documents quantitatively within basin patterns of erosion and sedimentation and concomitant adjustments in stream channel morphology in response to modifications induced by logging, stream improvement, and river driving. Such a study could address such questions as: How did logging - river driving - stream improvement alter the original conditions? What channel and riparian changes occurred as a result of lumbering? How much recovery has occurred? How many present lakes originated as the reservoirs of logging dams? What adaptive re-use of logging dams and dam sites has occurred? What effects do the remnants of various stream improvement structures have on present stream flow, deposition, fish, etc.?

The removal of billions of feet of timber along the streams left the sandy glacial soils open to erosion. Especially along the mainstreams, slumping of banks into the stream occurred at many points. Silt collected rapidly in the sluggish backwaters of the logging dams and eradicated many forms of aquatic insects. The slack water behind these dams raised the water temperature which encouraged warm water
fish species to the detriment of the native trout. Undoubtedly, the scouring force of the artificial freshets released during log driving killed zooplankton, insect life, and some fish. The removal of driftwood, large boulders, and stream side brush meant a considerable reduction in fish cover. The cutting of tall trees along their banks, that had created a dense shade, exposed the stream to irradiation by direct sunlight. The result of all this was a very noticeable decrease in the number of native brook trout. Even before the turn of the century, plantings of rainbow, brown and brook trout were made in attempts to replace the decreasing number of native brook trout. Except for a brief study of the Brule River, the impact of lumbering on fishlife remained a largely unexamined topic until just recently (O’Donnell, 1944). In 1993, a research team, that included archaeologists, fluvial geomorphologists, and a fisheries biologist, completed a two-year examination of the effects of historical logging on the fluvial geomorphology and fisheries habitat along the Indian River in the Upper Peninsula of Michigan (Benchley, et al, 1993). This study suggests many areas for future studies. Particularly important would be a study to determine if what happened on the Indian River was typical.

Eventually the railroads replaced the waterways for the transportation of logs. While the importance of railroads in transporting lumber began as early as the 1850s and grew in importance with each decade, the streams by and large, continued to be the main means of moving logs from the woods to the mills and only sawn lumber was shipped via rail. The use and growth of railroads in logging operations came about because of the pending exhaustion of the white pine along the streams, the increasing use of hardwoods, which water-logged and sank in water, and a series of mild winters. The first successful logging railroad in the Lake States began operations in Michigan in 1877. Its success generated numerous attempts at rail logging, and within five years there were over seventy-five logging railroads operating in the Lake States (Rector, 1953, p. 221).

The use of the railroad in logging brought further changes to the land. The construction of railroads, of course, meant the clearing of right-of-ways and the making of grades. The local gravel deposits excavated for ballast also left a noticeable mark on the landscape. In addition many types of bridges and trestles were built. Streams, from the smallest creeks to large rivers, had to be crossed in order to obtain a favorable grade and to avoid excessive rock cuts, fills, etc. The logging railroads also used enormous quantities of forest material for ties, bridges, trestles, etc. The environmental impact of these railroads, however, remains largely unexamined. Today from the ground many of the former logging railroads and spurs are obscured by vegetation. From the air, however, they form an intricate maze of many patterns winding and criss-crossing through mile after mile of forest land. The grades of these former logging railroads are common features in today’s landscape. One potential study would be to examine the logging railroads of a selected company and determine what happened to them. How many became part of common carrier systems, how many became highways, local or forest roads, fire lanes, or hiking, skiing or snowmobile trails?

The numerous sawmills created enormous quantities of waste. The massive waste produced by the circular saws of the early mills nearly buried them in sawdust and chips. Sawdust and other waste was generally just dumped into the stream on which the mill stood. This practice sometimes actually created new islands in the rivers. Every rise of the logging streams brought down enormous quantities of sawmill debris. A newspaper article in 1865
described the Oconto River in Wisconsin as paved with slabs and sawdust, a condition which greatly effected the navigability of the stream (Green Bay Advocate, August 10, 1865).

In 1880 the U.S. fisheries agent in Green Bay reported that sawdust from lumber mills on the Menominee River was clogging fishermen's nets and burying whitefish spawning grounds under as much as eight feet of mill debris (Rohe, 1984c, p. 23). That same year the Wisconsin legislature passed its first law prohibiting the dumping of mill refuse. No existing study examines pollution of streams by mill waste. Such a study might show how and why perceptions changed and resulted in legislation to protect the environment.

Origin and Diffusion of Logging and Lumbering Methods

The increasing impact that lumbering exerted on the land corresponded with a changing technology. One of the major changes which took place in logging was the substitution of the crosscut saw for the ax in felling the trees. Available evidence suggests this transition began in the middle 1870s but more detailed study would provide a more complete picture of the pace and direction of this change.

Another important innovation was the introduction of the peavey and cant hook in place of "swing dogs" and hand spikes. Supposedly the peavey was developed in 1858 in Maine by Joseph Peavey, but was not used in the Lake States until after the Civil War and did not achieve widespread use until the late 1870s or after. Given the continual exodus of loggers from the Northeast to the Great Lakes and their constant movements within the Lake States, it seems unlikely that the adoption of an improvement like the peavey would have proceeded so slowly. Perhaps a study incorporating historical and archaeological data could more precisely date the adoption of the peavey and offer insight into its diffusion through the Lake States.

The band or ribbon saw began replacing the circular saw during the 1880s. As its name suggests the band saw was a continuous strip of steel about 15 inches wide and 50 feet long with teeth on one edge. The saw was operated like a pulley belt. The band saw required less power, cut a much narrower kerf than the circular saw which reduced waste, and produced a better grade of lumber. Despite its recognized importance to the development of milling technology, the only work that examines the band saw is Rodney Loehr's "Saving the Kerf: The Introduction of the Band Saw Mill" (1949). This short article focuses almost entirely on the development of a successful band saw by the Hoffman Company and completely neglects its diffusion to and spread through any of the major U.S. lumbering regions.

While J. F. Hoffman exhibited a practical band saw at the Centennial Exposition of 1876 and some lumbermen tried introducing such saws into their mills in the next few years, it was not until the '80s that the band saw really began replacing the circular saw in the Lake States. What factors influenced the direction and pace of introduction? Where was it first introduced and why? When did it become the primary saw employed in the mills of the region? What effect did it have on lumber production and did it result in the development of other sawmill equipment?

Preservation - Interpretation

Historical geographers have the opportunity to apply their expertise in new and innovative ways to derive information, evaluate it, and communicate it to the public (Jakle and Janiskee, 1975, p. 194, 197-198). Based on
the premise that historical legacies contribute to the creation of a more appropriate physical and psychological envelope for society, geographers potentially can apply their research on the Lake States lumber era to cultural resource planning and historic preservation. Geographers can help identify features and/or landscapes to be preserved. "The geographical frame work provides a time-space context for the assessment of cultural resources that explicitly includes consideration of larger, systematically related associations and features" (Seager and Steinitz; 1981-1982, p. 38).

Descriptions of little documented social groups, activities, processes and methods offer great potential for interpretation and so it is with the lumber era. The physical remains of past lumbering are widespread in the Lakes States. The remnants of hundreds of logging camps, lumber towns, logging railroads, tote roads, driving dams, booms, sawmills, etc. dot the region's landscape. While these sites have great interpretive value, they have little been used as such despite the recognized need for such use by professionals and the great public interest in logging history. Efforts are needed to identify interpretative themes and opportunities and to develop plans for their presentation to the public (Overstreet, 1982, p. 12, 67-68, 126, 233-234).

Conclusion

Today the era of the great pine forests and the men who cut them is scarcely more than memory. The passage of time coupled with the action of man and nature has obliterated or considerably altered many of the landscape elements left by the lumber industry. In its half century of dominance, however, the industry left its mark on the geography of the Lake States. It not only changed the face of the land but influenced settlement, urban development, population, place names, transportation routes, migrations and the other geographic elements and patterns. This brief essay could not hope to enumerate all the possible contributions that geographers can make to our knowledge of the Lake States' lumber era, but hopefully it demonstrates that any adequate understanding of its present landscape, its present geography, demands a geographical examination of the lumber era.

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